BUILDING TRANFORMATIONAL CAPABILITIES 8

The first chapter of the ATR explains the Army Transformation Strategy and details Army processes for developing transformational capabilities from an inherently joint perspective. Chapter 2 discussed battle command and how fully networked battle command capabilities bridge Current to Future Forces and enable interdependent network-centric warfare. Chapters 3 through 6 discussed Army capabilities and Joint interdependencies necessary to support JFCs' execution of the JOCs. The previous chapter covered additional transformational initiatives in support of Defense Transformation efforts. This chapter describes the Army's efforts across DOTMLPF activities to build transformational capabilities. The JOpsC states people are the cornerstone of the future Joint Force. In covering the DOTMLPF domains, the chapter starts with the human elements (Personnel; and Leadership, Leader Development, and Education).

PEOPLE–THE HUMAN DIMENSION OF TRANSFORMATION

Transformation begins and ends with people. The human dimension of the military's transformation remains the crucial link to both the realization of future capabilities and the enhanced effectiveness of current ones. Army human resource (HR) policies, systems, and enablers encompass military, civilian, contractor, joint and multinational forces to provide the Joint Force with the right individuals and units, at the right place, and at the right time. Human resources support to the Future Force is critical to enabling full-spectrum operations.

The Army has started to install comprehensive, integrated, and interoperable HR programs, policies and procedures across the Army and within the joint, interagency, and multinational environments. In FY03, the Army activated the Human Resource Command (HRC). The Army HRC merged the AC and RC personnel commands and will also include the Civilian Human Resources Agency, no earlier than FY05. As a field operating agency under the Army's G-1, HRC is at the center of the Army's initiative to mold personnel functions into a corporate structure. HRC enables efficient and effective management of active duty and Army Reserve Soldiers worldwide.

The Army electronic Human Resource System (eHRS) converts over 200 human resource systems into a single web-based system. Army eHRS includes the Defense Integrated Military Human Resource System (DIMHRS), a DOD-directed software capability using the PeopleSoft commercial off-the-shelf (COTS) management system. DIMHRS includes modules to provide additional capabilities such as training management and manpower analysis. The new Army HR system provides commanders with the tools to accomplish the core battlespace functions of personnel accounting and strength reporting (PASR), casualty management, replacement operations, postal operations, and essential personnel services.

The Army's transformed HR system will institutionalize personnel support for a lifetime of service. The HR system will formalize the concept of a "continuum of service" by providing personnel services and pay support "in and out" of active duty, based on the needs of the Army and the individual. Soldiers will have the option to serve in different components or on different statuses of continuing service throughout their careers. This option spans from their original accession to multicomponent service in the Active Army, Army National Guard (ARNG),

or Army Reserve and follow-on service as a Department of the Army Civilian (DAC), retiree or contractor.

In addition to increasing the effectiveness of the HR system, the Army is transitioning to a Force Stabilization and Unit Manning System (FSUMS) that synchronizes assignments of Soldiers to units' operational cycle. The FSUMS minimizes personnel turbulence as a training distracter, allowing unit commanders to attain higher levels of operational capability with a cohesive combat team. The Army is reviewing policies, procedures and regulations to support the shift from an individual-centric to unit-centric environment. The goal of the FSUMS is to provide ready and effective combat formations to combatant commanders while reducing turbulence, increasing predictability and providing stability for Soldiers and families. The Army is implementing the FSUMS with the 3 rd SBCT in Alaska in FY04.

Army civilians play an important role in accomplishing the Army's mission. The Army is implementing a senior Army work force initiative to sustain an experienced corps of civilian leaders and managers to provide essential support to Army forces. These civilian leaders manage vital government functions, provide institutional knowledge, and supervise Army civilians and contractors in operational theaters.

LEADERSHIP, LEADER DEVELOPMENT, AND EDUCATION

The art and science of leadership continues to be our stock in trade, with leader development the lifeblood of the profession. The Army supports Joint Transformation by developing innovative and adaptive leaders comfortable operating in joint, interagency and multinational environments.

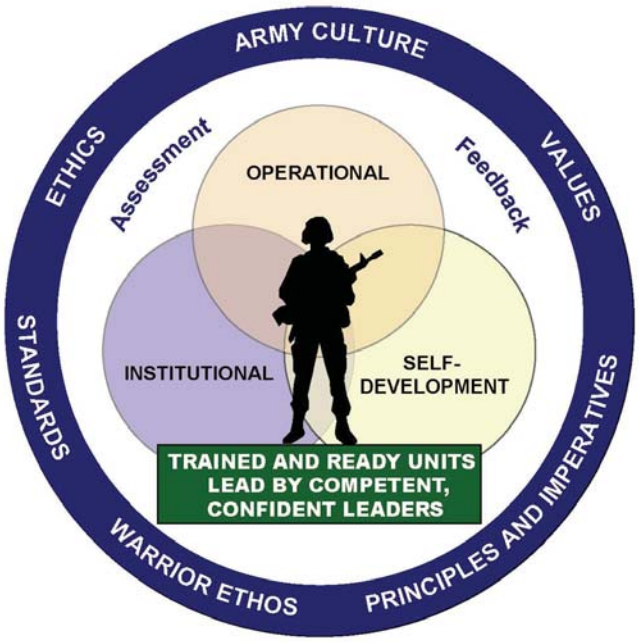
Leadership is about people. Composed of enduring competencies, its preeminent characteristic is developing trust between the leader and the led. Leadership is influencing people—by providing purpose, direction and motivation—while operating to accomplish the mission and improving the organization. The definition of leadership and the Army's leadership framework of "Be, Know, Do" is relevant to realizing both Current and Future Force capabilities.

Leader development is the means for growing leaders prepared for the challenges of full-spectrum joint force operations. The Army is transforming leader development and training programs to focus on gaining and sustaining the high levels of technical and cognitive skills essential for operating future systems and integrating future technologies. Future Force leaders must possess the following traits: multifunctional, comfortable with ambiguity, knowledgeable on information technology and system of systems operations, and capable of intuitive assessments of situations for rapid decision-making.

Leader development transformation occurs by exploiting education and information technologies within the institutional, operational, and self-development domains of leader development. These learning domains will have a fully embedded, integrated, seamless education and training architecture. This architecture will use distributed, global, LVC environments and provide continuous reach. Assessment and feedback on performance and self-development will occur on-demand to allow leaders to grow their competencies earlier in their careers. Figure 8-1 illustrates the Army Training and Leader Development Model.

Professional Military Education (PME) transformation integrates structured programs of instruction across officer and noncommissioned officer (NCO) training and education through a common training scenario (CTS). Officers and NCOs at resident institutions, home station, and on deployment via distributed learning will conduct real-time training on planning and executing full-spectrum operations within the CTS. Operational and strategic level education starts earlier in leaders' careers to inculcate the joint and expeditionary mindset. The Army has started

ARMY TRAINING AND LEADER DEVELOPMENT MODEL



- Progressive and sequential and continuous
- Educational and operational experiences interwoven
- Operational experience includes mix of home station, Combat Training Centers and, while deployed, in Army and joint, interagency and multinational environments
- Gaps in knowledge/skills filled thru self-development accessing networked systems
- Assessment and feedback at individual, organizational, and Army levels promote readiness

Figure 8-1. Army Training and Leader Development Model

to implement the Basic Officer Leader Course (BOLC) to provide all new lieutenants with a common set of skills and leadership competencies. The course instills the warrior ethos at an early stage and produces leaders positioned for success in the joint operational environment. Assignment-Oriented Training (AOT) and education prepares leaders and Soldiers to hit the ground running. AOT increases the relevance and readiness of units by tailoring training and providing knowledge to personnel focused on the immediate requirements of their next unit of assignment. PME will continue to be universal, progressive and sequential, with emphasis on continuous, life-long learning. Timelines for accomplishing PME and fostering commitment to life-long learning are flexible and adaptive to support the readiness of units. Current career paths will evolve to incorporate Future Force developmental requirements.

Current and Future Forces rely on the enduring competency of the Army to grow leaders and on the corresponding trust developed between the leader and the led. The transformational essence of leadership development is the movement from three separate but complementary pillars to a balanced, integrated, and progressive model. This new model enables full-spectrum-capable Army forces to increase the dominance of the Joint Force. Growing competent, adaptive and self-aware leaders, comprising the Army warrior culture, is essential to instill a culture of innovation in the Army. These leaders are the centerpieces of a campaign-quality Army with a joint and expeditionary mindset.

TRAINING

The Army must develop Soldiers and leaders to ensure they are competent and confident in their ability to lead at the levels assigned. Achieving a ready Current Force today and a transformed Future Force requires a similar transformation in the way units train for joint operations. To meet JFCs' needs in current and future operational environments, training must prepare the force to learn, improvise, and adapt

to constantly changing threats in addition to executing doctrine, missions and tasks to standards. Training must also accommodate the unique requirements of AC and RC to assure total force readiness.

The Army's Training Transformation initiative, supporting the June 2003 Defense Department Training Transformation Implementation Plan, provides dynamic, capabilities-based training and mission rehearsal for Army forces to accomplish their mission in joint operations. Objectives for the Army's initiative include:

- Preparing forces for new warfighting concepts
- Continuously improving joint force readiness by building capabilities from Service education and training resources to joint education and training resources to fulfill combatant command requirements
- Developing individuals and organizations that intuitively think joint
- Developing individuals and organizations that improvise and adapt to emerging crises and rapidly incorporate operational experiences and lessons learned
- Achieving unity of effort from a diversity of training means

Training transformation begins by changing behaviors. Creating, storing, imparting, and applying new knowledge throughout the force, individually and collectively, fosters these changes. Three capabilities form the foundation for training transformation—Joint Knowledge Development and Distribution Capability, Joint National Training Capability, and the Joint Assessment and Enabling Capability.

Joint Knowledge Development and Distribution Capability. Current and Future Forces must have a joint and expeditionary mindset, possessing the intellectual capability to intuitively think joint. The intellectual interoperability required to integrate Army capabilities into the Joint Force comes from the acquisition of Army skills with a mastery of joint concepts and doctrine. Future Joint Force leaders must reach new education and training standards by continually improving individual knowledge, skills, and abilities to achieve desired effects in decisive joint operations. Training Transformation leverages the use of knowledge to improve Army readiness by enabling personnel to think in terms of joint concepts, and by building upon Service education and training foundations: distance learning, embedded training, PME, multi-player online gaming, aviation training, and communities of practice (institutional training).

Joint National Training Capability. The Joint National Training Capability, as the integrating environment, provides training to the full complement of Defense organizations. Active and Reserve Component forces from a single Service train in a realistic joint context with other Service forces and joint battle staffs using extensive simulation support. Battle staffs from joint HQ, component HQ, and 10 tactical headquarters train and rehearse using actual command and control systems with operating forces represented through simulation. The Joint National Training Capability builds an environment in part from Army national training capabilities to improve vertical and horizontal training of staffs in operational planning, rehearsal and execution.

The Joint Assessment and Enabling Capability (JEAC). The JEAC ensures systematic assessment of Training Transformation plans, programs, and investments throughout the Department to produce continuous improvement of Joint Force readiness. The Joint Training System (JTS) emphasizes joint training as necessary to fulfill the mission essential tasks of the combatant commands, while enhancing the Services' competencies. The Training Transformation initiative links the focus of Service training to the JTS and increases the quantity, quality, and priority of joint training. Army training and assessment capabilities enable this joint capability to produce a force capable of interdependent network-centric warfare.

ORGANIZATIONS

As discussed in Chapter 1, creating modular organizations is an important component in achieving ready and relevant dominant land power capability for the Joint Force. The Army is in the process of redesigning two of its divisions to enhance modularity of the Current Force.

Over the last four years, the Army has developed the organizational constructs for truly network-centric capable tactical formations—the SBCT for the Current Force and the UA for the Future Force. The Materiel section of the chapter presents additional detail on these units.

The Army has also designed Future Force UEs. UEs are tailorable, higher-level echelons that integrate and synchronize Army forces for full-spectrum operations at the higher tactical and operational levels of conflict. They focus on battles, major operations, and campaigns in support of joint operational and strategic objectives. They participate in all phases of joint operations from initial entry to conflict termination in any form of conflict and operating environment and in all weather and terrain conditions.

UEs can command and control Army, joint, and multinational forces. They perform the C2 functions as the Army Forces (ARFOR) component, JFLCC, or the JTF. They have the inherent capacity to interact effectively with multinational forces as well as with interagency, nongovernmental organizations, and private organizations.

The general-purpose quality of this aspect of the Future Force ensures its long-term relevance to adaptive, sophisticated threats and the frequently changing requirements of the joint operational environment. At the operational and higher tactical levels, UEs provide the JFC with an extraordinary combination of options to exploit opportunities and respond to uncertainty across the spectrum of conflict. Through the conduct of multiple decisive tactical actions, executed at high tempo, UE operations lead quickly to the enemy's operational disintegration and the successful achievement of campaign objectives. Within this framework of decisive operations, the Army's ability to close with and destroy enemy forces remains critically important.

The Medical Reengineering Initiative (MRI) is a good example of modularity. MRI promotes scalability through easily tailored, capabilities-based packages that result in improved tactical mobility, reduced footprint, and increased modularity for flexible task organization. This design enables the JFC to choose among augmentation packages, thus enabling rapid synchronization of desired medical capabilities. Several initiatives and processes are in place as strategies to mitigate resourcing risk. One example is the Hospital Optimization and Standardization Program (HOSP) that safeguards and stretches limited modernization dollars and personnel authorizations within AC CONUS-based hospitals without compromising readiness. The Adaptive Medical Increments (AMI) initiative increases the range of options for responsive support through the rapid deployment of capabilities-based, mission-tailored, cohesive medical increments.

Another example of organizational initiatives is the Army-Guard Restructure Initiative (AGRI). The AGRI includes efforts to redesign existing Army National Guard formations into Multifunctional Divisions (MFD) and Mobile Light Brigades (MLB). MFD and MLB provide new capabilities as part of the Army's program to rebalance AC and RC to develop more modular, strategically responsive organizations while cultivating and institutionalizing a joint and expeditionary mindset throughout the force.

DOCTRINE

Doctrine is a set of fundamental principles that guides actions. TRADOC has developed the Future Force Capstone Concept as well as subordinate and supporting concept and capabilities documents. At the same time, TRADOC developed the doctrine for the Current Force's SBCTs to support the Army's goal to go from

concept to initial operating capability (IOC) in three years.

TRADOC has also undertaken an object-based publishing initiative to rapidly integrate proven concepts, lessons learned, tests and experimentation results into Army doctrine for maintaining and sustaining the Current Force as the Army transforms to the Future Force. The effort decomposes doctrine and selects mission training plans (MTPs) and lessons learned into low-level, stand-alone pieces (called chunks) of information. Doctrine developers classify the chunks for easy retrieval based on a classification scheme—a taxonomy. The chunks then become objects. A doctrinal object is the lowest level of self-contained doctrine that has practical application to the warfighter. Object-based publications provide greater efficiencies by replacing the complicated hierarchy of manuals. This one-time entry of information eliminates redundancies and creates web-based relational doctrine that links all appropriate information for the Soldier. Object-based doctrinal publications provide the Soldier combined arms and other doctrine, tailored for specific needs. The Soldier can then store this information for later use. Additionally, doctrine developers can quickly reassemble objects to form traditional doctrinal manuals.

MATERIEL

The Army is taking specific steps to develop and field systems that enable Current and Future Forces to provide the capabilities the JFC requires to execute the JOCs. Many of these capabilities come from the procurement and fielding of critical transformational systems and families of systems including:

- The Stryker Family of Armored Vehicles
- The Network, to include the Warfighter Information Network-Tactical (WIN-T)
- The Joint Tactical Radio System (JTRS)
- The Distributed Common Ground System-Army (DCGS-A)
- Soldier Modernization
- The Comanche Armed Reconnaissance Helicopter
- The Future Combat Systems (FCS)
- An Army-standard and Joint-interoperable Battle Command System (BCS)
- Precision Munitions
- Air and Missile Defense Systems
- Critical Sensors
- Distribution-based Logistics (DBL) systems

The Army is investing in other critical technologies based on Future Force capability requirements to inject into the Current Force to enhance immediate needs of the Joint Force. The following section highlights materiel programs and related initiatives organized by the functional concepts.

Battle Command. Battle command capabilities bridge the Current to Future Force and enable interdependent network-centric warfare. As discussed in Chapter 2, battle command covers the Joint Functional Concepts of Joint Command and Control and BA. Recent combat experience has shown the value of shared situational awareness in conducting network-centric operations. The Army is developing organizations and fielding equipment to capitalize on these important lessons and insights.

Good Enough Battle Command. Operation Enduring Freedom, OIF and other military operations have demonstrated the importance of shared situational awareness to enable the Joint Force to support knowledge-enabled strike and maneuver. The combatant commander's need for greater situational awareness allowed the Army the opportunity to field improved blue force tracking capabilities to Army, Joint and coalition forces in OIF. This OIF finding has provided the impetus for planning and fielding the same C2 capabilities throughout Army formations.

Initial Army analysis and Joint findings identified the essential battle command capabilities and established the resourcing requirements to

meet current combatant commanders' needs. The Army has coined this critical first step as the battle command Good Enough strategy.

The Good Enough strategy is a capabilities-based effort based on OIF JFC requirements. The plan defines the good enough capability and sound fielding strategies consisting of reprioritization of existing Army Battle Command System (ABCS). This good enough plan uses existing resources available in the ABCS program to standardize software by April 2004, integrate only essential additional capabilities to ensure joint interoperability, and distribute this standardized capability to the Current Force.

Army analysis and Joint findings provided the following insights into essential capabilities:

- Joint and coalition interoperability, a requirement to meet joint interoperability existing and emerging standards over time
- Friendly locations, a need for a near real time, digitized visualization tool to display locations of all Services, allies, coalition and interagency formations within the battlespace
- Current enemy situation, a need for a digital visualization tool to display and provide knowledge of all enemy formations in the battlespace
- Running estimate, a collaborative, predictive tool and capability tied to the commander's critical information requirements and decision making
- Graphic control measures, a need for a management and visualization tool to display operational graphics in relationship to the JOA and terrain
- Commander's situation report; a digitized capability to share unit status to include personnel and logistical information to higher, and adjacent units
- Fragmentary order, a digital capability to exchange information changes of mission, intent, priorities with higher, lower and adjacent units in the battlespace
- Fire support coordination measures, a need for a digitized, visualization and management tool that enables the execution and deconfliction of fires

Following the Good Enough strategy, the next step in this effort is determining Current Force command post standardization by echelon and unit type. This step requires a balance between resources, current operational requirements and transformation efforts. Command post standardization encompasses the above findings to establish the core capabilities and build common hardware, communications, organizations, procedures and command platforms by unit type and echelon. The goal is unit command posts by type and echelon with equal capabilities, common systems, seamless operations and standard training requirements.

Good Enough battle command is part of the overall Army Battle Command Way Ahead Strategy. The Army battle command Way Ahead Strategy is a capabilities-based strategy that encompasses the intent of JBMC2 and applies operational experiences and lessons learned. The intent is to provide an improved capability now through technology inserts distributed across the Current Force to ensure units have the same capabilities and are interoperable with the Joint Force. The Army is also developing a single BCS-based on capabilities articulated from the JOCs and current JBMC2 guidance. The end state is the standardization and improvement of future battle command capabilities while enhancing current battle command capabilities.

The Army's current effort revolves around standardizing Army battle command software and exploiting the advantages of Force XXI Battle Command Brigade and Below-Blue Force Tracking (FBCB2-BFT). This effort produced a fielding strategy, named Leader Distribution option, which establishes a density level of equipment throughout the Current Force. The Key Leader Distribution option also prioritized and synchronized the fielding to current units participating in OIF and OEF as well as scheduled follow-on units.

Operation Iraqi Freedom and OEF findings continue to inform Army battle command efforts. In close coordination with the U.S. Marine Corps and under the leadership of the Joint Staff, the Army is merging blue force tracking efforts and capabilities into a single joint capability. Simultaneously, the Army is synchronizing its transformation efforts to accelerate improved battle command capabilities and reprioritize battle command efforts in support of the Joint Force.

The Global Information Grid (GIG). The Army views the GIG as the critical backbone of the Joint Force. The GIG architecture spans space, air, and ground domains. In coordination and compliance with JFCOM and DOD's JBMC2 guidance, the Army continues to develop its architecture efforts as a member of the joint team with the intent of synchronizing its networked capabilities into the GIG. The Army Knowledge Enterprise Architecture (AKEA) defines the Army's portion of the GIG architecture. The AKEA leverages WIN-T and JTRS capabilities to form a single Army Enterprise Infostructure (AEI). By entering the GIG, the Army expects to benefit from the seamless end-to-end capabilities that will enhance its warfighting capabilities. Specifically, tactical units will gain significant capabilities through the upcoming integration of software-programmable, multiband communications systems that exploit adaptable and high-capacity waveforms. As Future Force network capabilities integrate into the GIG, the Army also expects to leverage highly mobile, self-organizing, self-healing, multilevel secure, resilient, and ubiquitous networking capabilities.

Current communications networks provide an inflexible backbone, limiting the commander's scheme of maneuver and ability to conduct command and control. Tactical network performance has historically been severely constrained by bandwidth limitations and interoperability issues. To overcome these limitations, the Army has leveraged high-capacity commercial satellite networks to support urgent tactical requirements

Figure 8-2. GIG Components

such as on-the-move and at-the-quick halt battle command. These commercially based satellite communications (SATCOM) capabilities will migrate to DOD SATCOM networks as the Army integrates its future capabilities into programs developed under the Transformational Communications Architecture. Specifically, the Army will migrate from a circuit-based and bandwidth constrained communications architecture to a net-centric, internet protocol (IP)-based GIG architecture. Future networks will enable the commander to conduct his C2 functions from home station, en route, during entry, and while deployed regardless of how austere the area may be.

When the GIG architecture is linked to transformational communications enhancements such as dynamic radio frequency (RF) allocation (with software adaptable waveforms), laser communications, satellite cross-linking, and fiber offloading of the space segment, then many of the existing constraints will be eased. The transformation of Army communications is an inherently joint process, and the joint interde-

pendencies cannot be overstated. Crucial to the GIG and Army networks transformation efforts will be the success of DOD and Army programs including GIG-Bandwidth Expansion, Teleport, Global Broadcast Services, JTRS and WIN-T. Equally crucial to the GIG transformation is bandwidth optimization and the success of Network Operations (NetOps) initiatives covered in Net-centric Enterprise Services and GIG Tranformational Communications.

Implementing and fielding improved network and battle command capabilities by introducing mature technologies including satellite communications to the Current Force enhances the combatant commander's operational capabilities. Because of the exponential requirements growth for SATCOM for both reach and intra-theater beyond-line-of-sight (BLOS) communications, the Army augmented its military SATCOM capabilities with commercial SATCOM. In light of the immediate OIF/OEF SATCOM requirements, the Army expedited baseband (data packages) and tactical SATCOM equipment for the Southwest Asia (SWA) theater. The Army is currently reviewing its SATCOM equipment requirements and tactical employment concepts to realign with rapid maneuver operations concept requirements.

Working in the collaborative information environment, Army forces harness the power of the ongoing revolution in information technology to net people and systems—horizontally and vertically—within the joint network. The Army leverages the capabilities of the Good Enough Battle Command System while providing additional capabilities to complement Joint command, control, communications, and computers, intelligence, surveillance, and reconnaissance (C4 and ISR) systems to build and enhance the Network. These systems enable the JFC to see first, understand first, act first, and finish decisively. The Army has several systems that are vital enablers to achieve network-centricity—WIN-T, JTRS, and DCGS-A.

The WIN-T is the Army's contribution to the GIG. WIN-T received a successful Milestone B decision from OSD in FY03. The Army will field elements with WIN-T starting in FY06.

JTRS is a major transformational effort for the Joint Force. JTRS is a family of interoperable, digital, modular, software-defined radios that enables voice, video and data capabilities as well as wideband networking waveform. The Army will begin fielding Cluster 1 to first units during FY07.

DCGS-A is a family of systems and an integral component of the Army's ISR networking strategy. DCGS-A migrates disparate ISR systems into a joint common and interoperable multi-intelligence architecture to improve the JFC's ability to react within the enemy's decision cycle. DCGS-A nodes located at each Army and joint echelon task, process, exploit, and disseminate Army, joint, national, and coalition ISR sensor data and information in support of Joint operations. These physical nodes transparently interoperate with embedded DCGS-A software applications within the FCS. Operating in a secure collaborative, networked environment, DCGS-A provides real-time sensor-to-commander, sensor-to-shooter, and sensor-to-analyst information tailored to mission, task, and purpose of the recipient.

The DCGS-A program employs a blocked-approach development and acquisition strategy. The Army plans to demonstrate a DCGS-A Block I capability in FY04 with the XVIII Airborne Corps and a multi-echelon DCGS-A capability with the III Corps in FY05. The Army will field the Future Force capability starting in FY08.

Critical Sensors. The Army is deploying tactical unmanned aerial vehicles (TUAVs) within its units while at the same time developing the Aerial Common Sensor (ACS) for the Future Force. Netted sensors are critical to achieve battlespace awareness for the Joint Force.

Family of TUAVS. Current Army Unmanned Aerial Vehicle Systems (UAVS) capabilities in-

clude the RQ-5A Hunter, RQ-7A Shadow 200, and the Raven systems. RQ-5A Hunter and RQ-7A Shadow will meet Current Force UAVS needs until the development and fielding of Future Force UAVS capabilities.

UAVS located in FCS UA brigades will possess enhanced capabilities using a common platform and modular payloads. They will integrate into the established communication architectures. The Army divides UAVS into four classes to support different levels. Class I will be small man-packable UAVS employed by platoon size units for RSTA operations providing information directly to the Soldier. Class I will have a low-altitude flight profile that can provide perch-and-stare capability. An ongoing Advanced Concept and Technology Demonstration (ACTD) is evaluating the Micro Aerial Vehicle (MAV). The objective of the MAV ACTD is to demonstrate a backpackable, affordable, easy-to-operate, and responsive reconnaissance and surveillance system. The system will provide small units with useful, real-time information of difficult to observe and distant areas or objects.

Class II will be a vehicle-mounted and launched UAV for use by infantry companies and MCS platoons. It will provide target acquisition data and designation for LOS, BLOS and NLOS cooperative engagements with the Class II operating at a low-altitude flight profile. Class III UAVS will provide reconnaissance and target acquisition and designation data for precision fires assigned to NLOS battalion and reconnaissance detachments within the combined arms battalions. This UAV is a multipurpose platform sized to meet endurance and range keyed to NLOS fires capabilities. Class IV UAVS will be multifunctional to provide reconnaissance, surveillance, and target acquisition (RSTA) throughout the brigade area. Key capabilities are long-range, long-endurance, communications relay; persistent stare; target acquisition and designation; and the ability to team with the Comanche to conduct reconnaissance and surveillance (R&S) for the UA.

The Army's RQ-7A provides RSTA to the tactical maneuver commander. It has an initial range of 50 km, day or night, in limited adverse weather conditions with a future objective range extension of 200 km. Each system includes three

FUTURE COMBAT SYSTEMS UAVS : 2020 AND BEYOND

System Echelon	Operational Radius	On-Station Time	Operational Altitude AGL (MSL*)
UAV Class I *Support Platoons*	8 km (T) 16 km (O)	50 min (T) 90 min (O) per vehicle	500 ft AGL (10,500 MSL)
UAV Class II *Support Companies*	16 km (T) 30 km (O)	2 hours (T) 5 hours (O)	1,000 ft AGL (11,000 ft MSL)
UAV Class III *Support Battalions*	40 km (O)	6 hours (T) 10 hours (0)	2,000 ft AGL (12,000 ft MSL)
UAV Class IV*** *Support Brigades* ****More than one type vehicle may be used to accomplish the mission sets for this action*	75 km (T) 400 km (O)** **Limited duration in support of operations moves	18-24 hours (O)	6,500 ft AGL (min) (16,000 ft MSL)

aircraft with day and night payloads, two ground stations mounted on HMMWVs, and four remote video terminals to deliver near real time video to commanders on the ground. The Shadow 200 currently has an onboard EO/infrared (IR) sensor payload. Objective payloads may include, but are not limited to advanced EO/IR, all-weather SAR and moving target indicator (MTI), and signals intelligence (SIGINT) sensors. The RQ-7A is supporting OIF units and has flown more than 575 sorties and 2,300 hours. The Army has fielded the RQ-7A to the 4th ID, 2nd ID, 3/2 ID (SBCT), and 1/25 ID (SBCT). Full-rate production began in December 2002 with the end state to field TUAVs to 41 Brigade-level units by FY09. Figure 8-3 depicts the complete Shadow 200 fielding schedule.

Hunter UAV is the interim extended-range multipurpose (ER/MP) UAV. It is the commander's RSTA and battle damage assessment asset providing near real time imagery at ranges up to 200 km. The threshold range is 300 km with an objective range of 500 km and an on-station endurance of 12 hours threshold, 24 hours objective. The threshold payload is 200 pounds of ISR/C2 and 400 pounds of weapons. The objective payload is 300 pounds of ISR/C2 and 1000 pounds of weapons. Advanced payloads will support various other missions.

Aerial Common Sensor (ACS). ACS provides the JFC with wide-area surveillance and precision targeting. ACS fills the Army's critical mission need for a worldwide self-deployable airborne reconnaissance, intelligence, surveillance, and target acquisition (RISTA) system. ACS supports early-entry and forward-deployed forces by providing timely I&W, dominant situational awareness, battle management, and precision targeting capabilities across the full spectrum of operations. These capabilities assist Army and joint commanders in the planning, preparation, and execution of assigned missions. These capabilities help commanders see first—allowing them to shape the battlespace and conduct decisive operations under conditions of their choosing.

ACS is integral to the Army's deep-strike architecture. It will survey new areas of operations

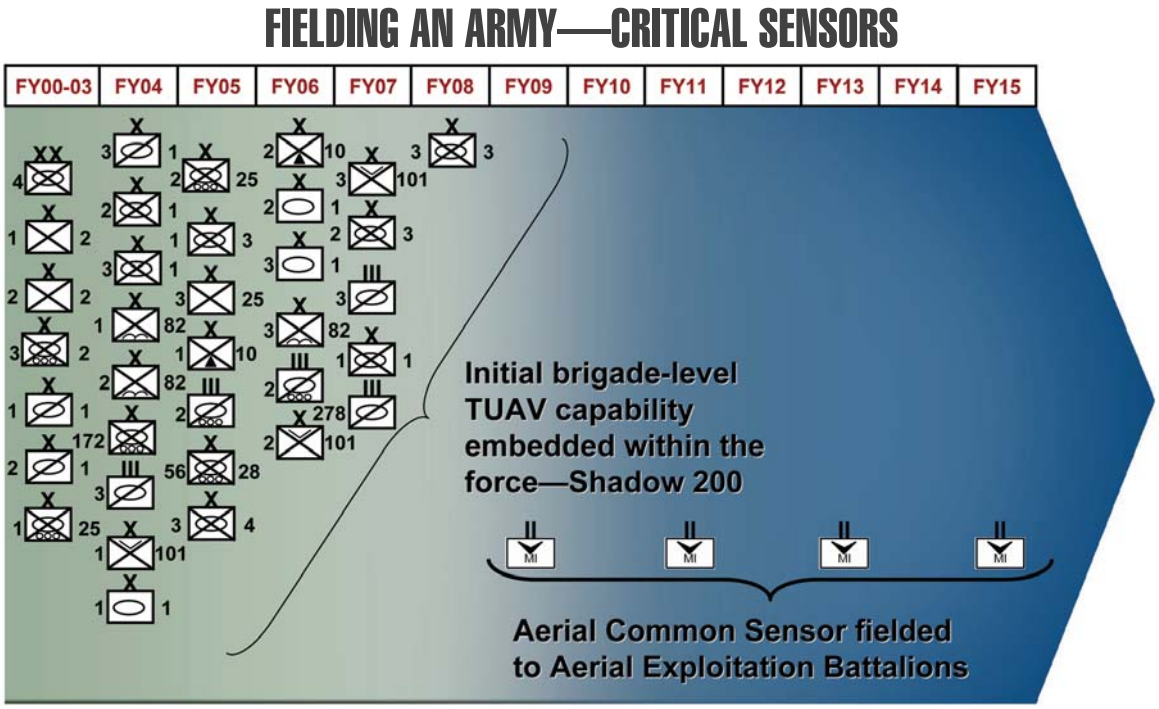


Figure 8-3. Critical Sensors Fielding Schedule

to facilitate changes to smart weapon algorithms. It will provide the dynamic precision targeting data needed by future deep-strike weapon systems and, with advances in multiple sensor packages (organic or linked), will enable on-the-spot battle damage assessment (BDA). The new ACS sensor packages will also facilitate the detection of movers, sitters, emitters and hiders—a first from any ISR sensor. Sensor payloads will include communications intelligence, electronic intelligence, and imagery intelligence and measurement and signature intelligence (MASINT) capabilities, such as EO/IR, SAR, MTI, multi- and hyperspectral imagery sensors.

ACS will be organic to the Army UA and will merge the capabilities of Guardrail Common Sensor and Airborne Reconnaissance-Low into a single, multifunction platform. This platform provides the requisite networked situational awareness and joint network-centric and deep-strike precision targeting for the Future JFC. ACS has its Milestone B decision in FY04. The Army plans to field ACS to an aerial exploitation battalion in FY09, with four additional systems fielded at a rate of one every two years. Figure 8-3 depicts the fielding schedule for TUAV and ACS.

Force Application. The ability to generate precision effects on adversaries is central to decisive Joint operations.

Stryker Family of Armored Vehicles. The Stryker Family of Armored Vehicles is the centerpiece combat and combat support platform for the SBCTs. The Stryker has two variants: the Mobile Gun System (MGS) and the Infantry Carrier Vehicle (ICV). There are eight additional configurations of the ICV: Reconnaissance Vehicle (RV), Mortar Carrier (MC), Commander Vehicle (CV), Fire Support Vehicle (FSV), Engineer Squad Vehicle (ESV), Medical Evacuation Vehicle (MEV), Antitank Guided Missile (ATGM) Vehicle, and Nuclear, Biological and Chemical Reconnaissance Vehicle (NBCRV). Stryker brings the following capabilities to the Joint Force:

- Strategically responsive and deployable on the U.S. Air Force family of tactical aircraft
- Immediately employable through roll-on/roll-off combat capable with minimum preparation
- Superior situational awareness with Internetted communications
- Enhanced survivability by all around 14.5mm armor piercing and 152mm artillery airburst protection (add-on armor provides protection against rocket-propelled grenades (RPG) antitank weapons)
- Accurate target acquisition with Long Range Advanced Scout Surveillance System (LRAS3) mission package
- Accurate target engagement with Remote Weapon Station (Mk 19 grenade launcher and M2 .50 caliber machine gun)
- Decisive offensive action with dismounted infantry assault (ICV)
- Bunker-busting capability with 105mm cannon (MGS) for roles in immediate fire support of dismounted infantry operations
- Responsive indirect fires with 120mm mortar (MC)
- Antitank capability with TOW 2B (ATGM) and Javelin-equipped dismounted infantry (ICV)
- Enhanced mobility enhanced by mine plow, roller and detector (ESV)
- Integrated NBC sensor capability (NBCRV)

The Stryker provides a unique family of systems approach that maximizes commonality and integrated capabilities. SBCTs fill an immediate capabilities gap in the Current Force. Supporting Stryker fielding is a complete new equipment training package for both operators and maintainers provided at home station. The Army plans to procure 2,121 total vehicles.

Stryker Brigade Combat Teams. The Army has fielded its first truly network-centric force, the SBCT. The SBCT is a combined arms force in both design and manner of deployment and

employment. It is fully integrated within a JTF; Stryker Brigades deploy rapidly, execute early entry, and conduct effective combat operations upon arrival. The first Stryker Brigade, 3/2 ID, has deployed in support of OIF. The second and third SBCTs are currently organizing and training. The Army will field six total SBCTs by the end of this decade—the AC will have five SBCTs by 2007 and the RC will achieve operational capability of its SBCT in 2010. The SBCTs will increase the deterrence options available to JFCs, increase rapid strategic response from power projection platforms, and inform development of the Future Force.

The Army has fully funded the Stryker program to field six SBCTs. Figure 8-4 illustrates the SBCT fielding plan and the selected units converting to SBCT design. The Army plans to integrate proven new capabilities to SBCTs in line with its Current to Future Force framework to enhance the Current Force.

Future Combat Systems (FCS). FCS is the networked system of systems that serves as the core building block within modular maneuver echelons to develop overmatching combat power, sustainability, agility, lethality, and versatility. FCS-equipped UAs are capable of full-spectrum operations against the full range of threats in any operating environment and in all weather and terrain. The FCS-equipped force enables the Future Force to see first, understand first, act first and finish decisively.

FCS-equipped UAs provide the Joint Force the overmatching combat power, sustainability, agility, and versatility necessary for full-spectrum military operations. FCS-equipped UAs allow Soldiers to operate as a coordinated part of a distributed, networked force. FCS provide the capabilities for the Joint Force to perform a wide range of military activities and operations, from small-scale contingencies to stability and support operations to MCO. FCS operates as part of an overwhelmingly lethal, strategically deployable, self-sustaining, and survivable combat force. FCS leverages advanced technologies with the capability to rapidly incorporate future advances through a deliberate technology insertion and integration program. FCS provides a secure command, control, communications, computers, intelligence, surveillance, and reconnaissance (C4ISR) system to harness advances in the distribution and effective use of information power as part of the Joint Battle Management Command and Control network. FCS provides networked lethal direct fire, indi-

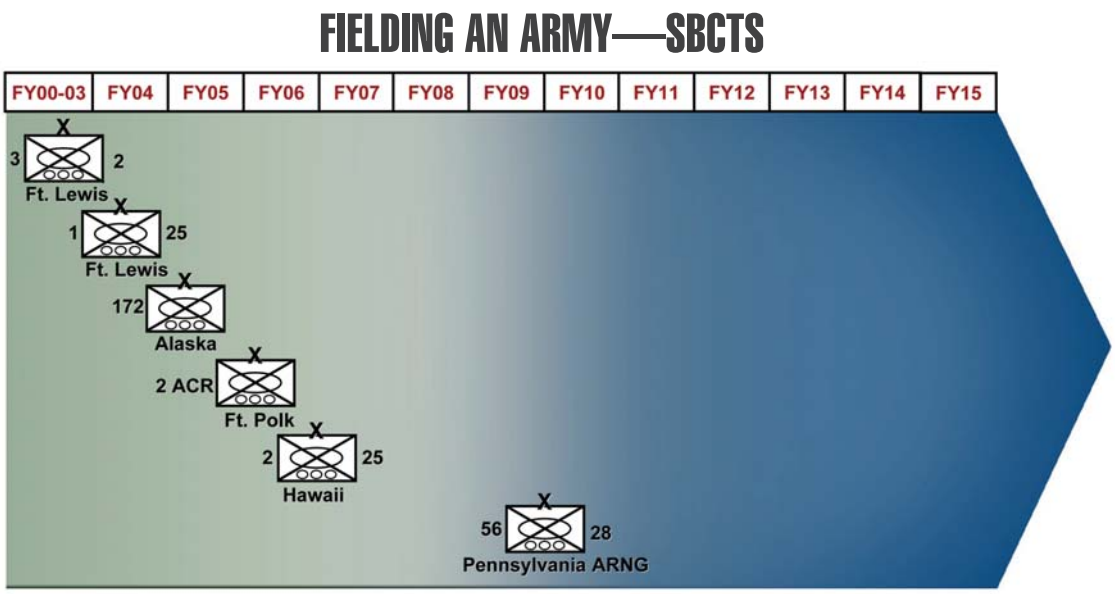


Figure 8-4. SBCT Fielding Schedule

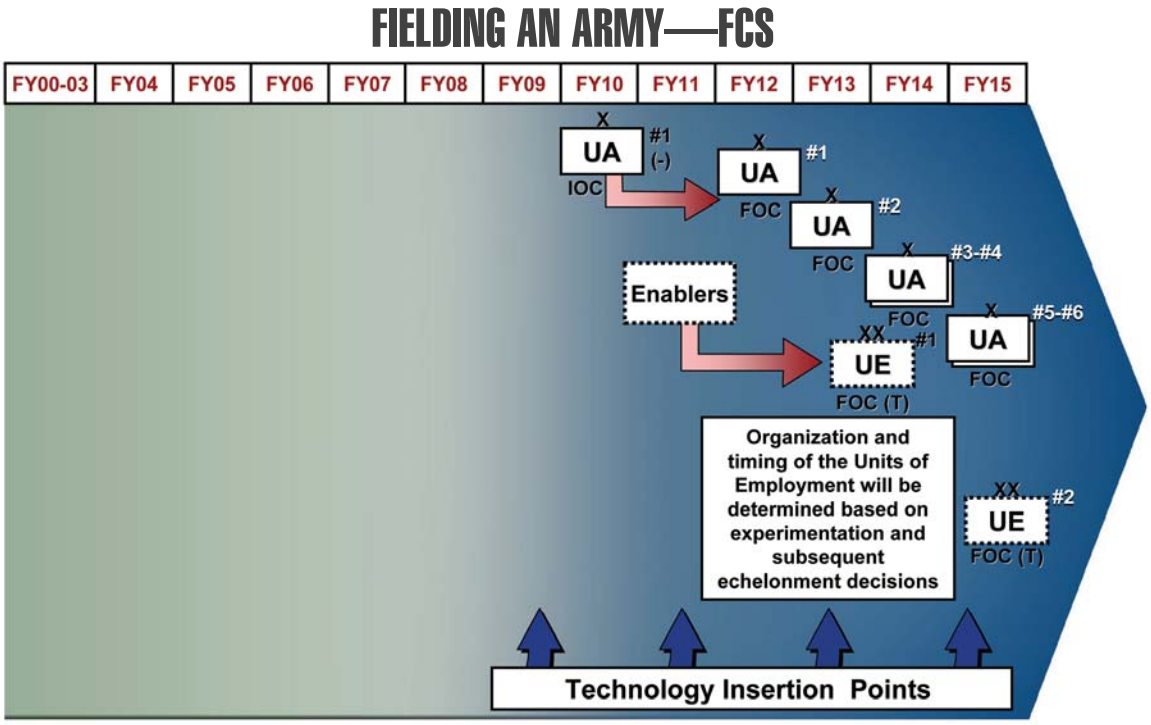


Figure 8-5. FCS-equipped UA Fielding Schedule

rect fire, air defense, complementary nonlethal fires and effects, and troop transport capability.

FCS consists of the network plus 18 manned and unmanned air and ground systems. FCS successfully passed its Increment 1 Milestone B in May 2003. The Army plans to achieve IOC within one combined arms battalion by 2010, expanding to a full operational capability (FOC) UA in FY12. The Army will obtain IOC in another FCS-equipped UA in the following fiscal year, ramping up to two UAs in subsequent years. Figure 8-5 details the fielding schedule for FCS-equipped UAs.

Comanche. The Comanche (RAH-66) is the Army's next generation helicopter, designed to perform armed reconnaissance and attack missions. The Comanche significantly expands the JFC's ability to conduct reconnaissance, security, and mobile strike operations in all battlefield environments, day or night, and during adverse weather conditions. Its advanced EO sensors, aided-target recognition, and sensor-weapons integration allow it to engage enemy targets with multiple organic and joint fire options. As a manned aircraft, Comanche provides the situational curiosity and judgment that UAVs and other unmanned sensors do not possess.

In addition, the Comanche, having been designed to leverage multiple internal and external sensors and weapons, is the first helicopter capable of network-centric operations. Comanche acts as a digital quarterback to harness and direct all joint strike capabilities on future battlefields. Supportability features include embedded diagnostics, minimal special tools, reduced support equipment, and fewer parts. These features reduce the logistics footprint of Comanche. The Army will begin fielding the Comanche in FY09 to the first UA. The Army will incorporate Comanche as an enhancement to the fifth SBCT, followed by elements in selected forcible entry divisions—the 82nd Airborne and the 101st Air Assault—as well as subsequent UAs and UEs. Figure 8-6 shows the Comanche fielding schedule.

Advanced Lift Capabilities. Extensive analysis and wargaming have shown that cur-

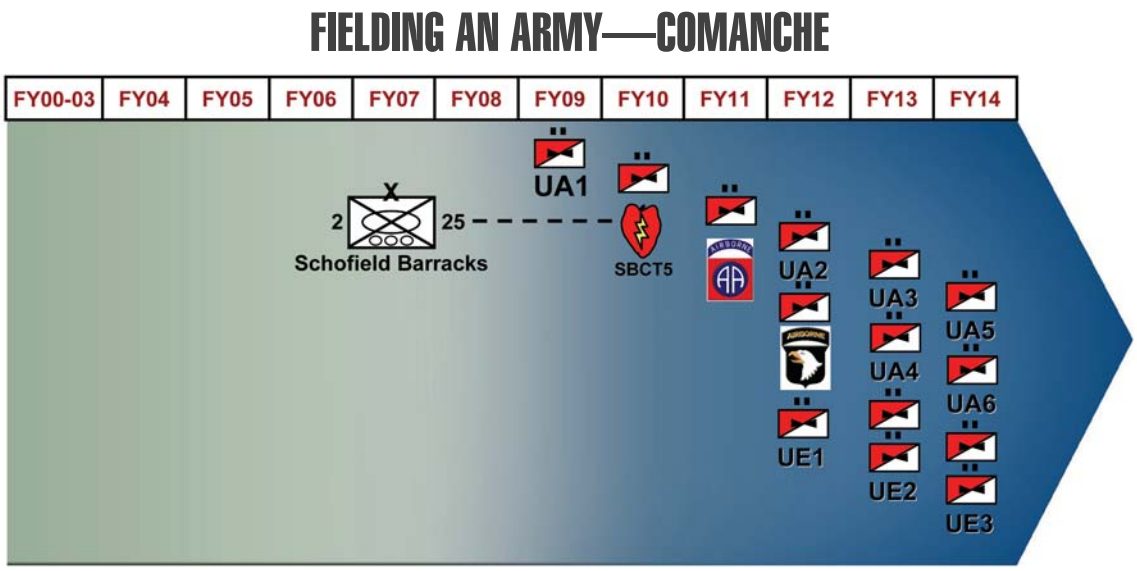


Figure 8-6. Comanche Fielding Schedule

rent and many planned strategic and intra-theater air- and sealift platforms do not support the JOCs. Many current sealift platforms require deep-water ports to berth and off load. The lack of such ports in future joint operational environments enhances adversaries' anti-access measures and jeopardizes the deployment of the Joint Force. Advanced sealift capabilities for brown water and over-the-horizon (OTH) sealift are critical to support efforts designed to defeat anti-access and area-denial methods. Shallow-draft high-speed ships use numerous ports in all areas of the world and support the concept of multiple, parallel seaports of debarkation (SPODs)—fundamental in overcoming anti-access challenges.

Existing strategic air platforms such as the C-5 Galaxy carry enormous loads, but depend on world-class airports for both embarkation and debarkation. The C-17 and C-130 provide the only capability today of bypassing major choke points from appreciable distances while maximizing load capacities. Even so, they still require at least a 3,000-foot runway and in many cases (weather, terrain, and environment dependent) may require larger runways when carrying sizeable loads. The venerable C-130 has significant payload, altitude, and range limitations and cannot refuel in air. These capability limitations not only severely constrain the Joint Force's ability to execute assured access strategies, but also demand a nearby intermediate staging base to transload equipment, personnel and sustainment from inter- to intra-theater lift platforms. None of the airlift platforms are suitable for air sustainment, nor can they support rapid shift of maneuver forces and sustainment across the breadth and depth of the battlespace.

To overcome the limitations of current systems, larger capacity SSTOL and HLVTOL platforms are necessary in substantial quantities for air movement of Future Forces. Similarly, SDHSS and Theater Support Vessel (TSV) platforms are necessary for sea movement of future forces to meet the needs of the Joint Force.

The SSTOL is a joint aircraft concept with the ability to carry two FCS platforms 3,500 miles. It can land on 750 feet of road or field in the joint area of operations. This capability avoids fixed airfields and adds innumerable points of entry. SSTOL provides the JFC the ability to achieve operational surprise.

The HLVTOL is an aircraft concept with the ability to deliver one FCS within a radius of 1,000 miles. The ability to insert combat vehicles vertically gives the JFC unparalleled speed and

agility. Generally independent of ground conditions, HLVTOL enables the JFC to exploit vertical envelopment and maneuver as well as the ability to avoid predictable, linear patterns of operation. It also offers significant benefits to vertical joint logistics over-the-shore.

The SDHSS is a strategic ship that delivers troops, equipment, and sustainment together in sufficient size and at a considerable speed to provide immediate combat power to the JFC. Because of the shallow draft feature, SDHSS can bypass established seaports and discharge its combat power wherever there is at least a 10-foot draft and an acceptable offload site. With a C4I suite onboard, commanders can conduct en route planning, receive intelligence updates, and coordinate effects with the Joint Force.

The TSV is the operational version of the strategic SDHSS. The TSV is a high-speed, 40+ knots, shallow draft sealift platform that maximizes COTS ferry technology currently in use in civilian markets. The TSV provides the capability to conduct operational maneuver and repositioning of intact unit sets while conducting en route mission planning and rehearsal (EMPR). This intra-theater vessel provides the JFC with increased throughput, survivability, and enhanced responsiveness through faster closure rates. It enables the JFC to insert combat power and sustainment into austere ports worldwide. Supporting Army pre-positioning stocks and Joint Logistics Over the Shore (JLOTS), the TSV expands the reach and capabilities of both land-based and afloat pre-positioning. This transport transformation enabler helps obtain Future Force deployment goals as well as achieving full distribution-based logistics. The Army is leasing two vessels for testing purposes. The Army is sharing the first vessel, Joint Venture, HSV-X1, with the Navy. The second vessel, Spearhead, TSV-1X, is an ACTD vessel and will perform test and evaluation activities in support of Current Force operations.

Whether the goals encompass operational maneuver from strategic distances, multiple simultaneous austere points of entry, vertical maneuver and envelopment, or focused logistics, the Joint Force needs advanced air- and sealift solutions sooner rather than later. These platforms provide a quality of versatility and adaptability necessary to enable the JFC to maintain operational momentum in response to the evolution of a campaign and the enemy's actions. Funding the S&T and procurement required to bring advanced lift capabilities to the Joint Force is a joint challenge. The Army alone cannot develop, procure and field such systems due to both budgetary and regulatory constraints. Instead, the Army encourages joint S&T and procurement emphasis in advanced lift capabilities.

The goals of Army deployment are to "project and sustain U.S. forces in distant anti-access or area-denial environments and defeat anti-access and area-denial threats"—one of DOD's critical operational goals. The Army is working several initiatives to support this goal. Significant investments in power projection infrastructure support rapid deployment of Current and Future Joint Forces. Additionally, the Army is conducting annual deployment readiness exercises to validate this infrastructure at SBCT locations. The Army is revising its Battle Command Training Program to meet more realistic planning and execution scenarios to better train division and corps staffs in the deployment process.

The Army is working within the joint community to achieve improvements in joint deployment automation and decision aids, in-transit visibility, and data management. Within this array, the Army is fielding the Transportation Coordinators' Automated Information for Movement System II (TC-AIMS II) and Joint Force Requirements Generator II (JFRG II). TC-AIMS II serves as the "sourcing" system and JFRG II serves as the feeder system to JOPES. The Army will field JFRG II as the standard unit movement system.

TC-AIMS II establishes the baseline for the deployment infrastructure needed to meet Future Force deployment objectives. The Army has

Service lead for the development of this joint system that addresses critical shortfalls in the movement of materiel and personnel. CJCSI 3020.01 directs the Services to field TC-AIMS II to their early deploying units by the end of FY03. TC-AIMS II merges the best business practices of the current Service-unique transportation automated information systems into a single system that combines the requirements for Unit Movement, Installation Transportation Office/Transportation Management Office, and Theater Distribution functional areas as well as integrating several existing systems from each of the four Services. TC-AIMS II improves joint capabilities for rapid worldwide deployment and redeployment, and enables individual units the autonomous capability to conduct rapid crisis response at UA level. Each battalion and separate company will receive training on TC-AIMS II and a complete suite of computer hardware.

The TC-AIMS II program has seven blocks of requirements that support a spiral software development strategy. The Army has fielded TC-AIMS II to U.S. Army European Command (USAREUR) and is currently fielding U.S. Army Forces Command (FORSCOM) and the U.S. Navy. All Services will receive TC-AIMS II by FY09.

The Army Pre-positioned Stocks Evolution (PREPO) program is transforming to support reconstitution of the force after OIF to execute the concept for the ARF. Support to the warfighter continues as the Army Watercraft Repositioning Program forward stations and prepositions watercraft assets to improve responsiveness for the combatant commanders.

The Precision, Extended Glide Airdrop System (PEGASYS) is a high-altitude-capable, autonomously operated precision airdrop system. The system consists of a family of differently sized airfoils, allowing airdrop of weight categories up to approximately 42,000 lbs. PEGASYS is not totally wind dependent and is releasable from altitudes up to 35,000 feet above mean sea level. Based upon winds and release altitude, 50 km standoff distances are also possible. Space-based global positioning systems (GPS) technology provides for aerial navigation throughout descent and permits highly accurate ground touchdown locations. PEGASYS is a critical Logistics Transformation enabler that facilitates dedicated aerial sustainment and helps achieve full distribution-based logistics. The PEGASYS ACTD will procure three to five each of the candidate prototypes for use in the operational demonstration and mature them to a level suitable for operational use.

Enable Theater Access (ETA) is an imperative that develops Army warfighting capabilities to gain theater access for deployment of joint forces through multiple austere A/SPODs. ETA has two components: Joint Rapid Airfield Construction (JRAC) and Rapid Port Enhancement (RPE).

JRAC capability increases the maximum on ground capacity of austere airfields, thereby reducing force closure time for aerial delivery of warfighting combat power. The S&T special technical operations (STO) effort is on schedule. In FY03, test sections evaluated site assessment, enhanced construction, and soil stabilization technologies. In FY04, the Army plans for a major C-130 airfield demonstration. RPE optimizes inter- and intra-theater sealift throughput at SPODs. Currently, the Army is funding the hydrobeam causeway as a 6.2 STO with $11M to maximize TSV utility.

Precision Munitions. The Army has a number of precision munitions programs that provide future JFCs with dominance in applying lethal effects with unprecedented accuracy and control. The Army is upgrading some of the precision munitions within the Current Force to increase their utility, deployability, sustainability, and accuracy. Army Tactical Missile System (ATACMS) and Guided Multiple Launch Rocket System (GMLRS) represent improvements to current systems.

ATACMS missiles are one of the JFC's all-weather, responsive, deep-strike weapons. The

Army develops these missiles in a logical series of improvements to range, accuracy, and lethality. Missile production funds a small number of ATACMS-Unitary missiles. The Army is restructuring the ATACMS program. The FY04-09 Plan terminates Block II/Brilliant Anti-Armor Technology (BAT) procurement and funds a small number of ATACMS-Unitary missiles. An Army/Navy ACTD is demonstrating an ATACMS-Penetrator variant.

GMLRS provides commanders with a precision munitions capability to ranges of 15-70 km. GMLRS is a major upgrade to the M26 series MLRS rocket with the objective of integrating a GPS-aided guidance and control (G&C) package and a new rocket motor to achieve greater range and precision accuracy. The improvement in accuracy (<3Mil CEP) reduces the number of rockets required to defeat targets, limits collateral damage, and directly contributes to the Joint Force achieving precision effects with a smaller logistical footprint. GMLRS system development and demonstration (SDD) is an international program with the United Kingdom, Germany, France and Italy. There is a RDT&E 50/50 cost-share agreement between the United States and European partners. The United States is managing the prime contract. The Army plans to field an IOC in FY06. GMLRS-Unitary is a low-collateral-damage rocket, capable of destroying high-payoff surface targets in complex and urban terrain with pinpoint accuracy. GMLRS-Unitary began a spiral SDD in FY03.

High Mobility Artillery Rocket (HIMARS). HIMARS provides early-entry Current and Future Forces with precision rocket and missile fires to a depth of 300 km. Mounted on a Family of Medium Tactical Vehicles (FMTV), HIMARS is C-130-transportable. It provides full MLRS family of munitions capability, yet requires 70 percent fewer airlift resources to transport a battery than the current M270 MLRS launchers. HIMARS is in engineering and manufacturing development (EMD). The Army plans to equip its first unit in FY05.

Lightweight 155 Howitzer (M777). An advanced, towed lightweight 155mm howitzer that meets increased operational thresholds for mobility, survivability, deployability and sustainability provides the Joint Force accurate, reliable, and responsive fires. The M777 Lightweight 155mm Howitzer satisfies this requirement. A joint Marine Corps/Army program, the M777 delivers on-demand, 24-hour, all-weather, all-terrain, close-supporting fires to maneuver forces. The LW155 weighs 40 percent less than the current howitzer. Due to an integrated digital fire control system, it can fire in one-quarter of the time. On 8 November 2002, the M777 entered low-rate initial production (LRIP) for 94 USMC Howitzers for delivery in FY03 and FY04. The FY04-09 Plan funds the procurement and fielding of this system to selected Army units, including the SBCTs.

Excalibur. Excalibur is a cannon-delivered precision engagement, extended range artillery projectile that self-guides to a programmed aimpoint. Target and fuse data programmed into the projectile via an inductive programmer allow precise target engagement throughout its range band. Munitions are unitary, smart and discriminating. Excalibur eliminates the shortcomings of current area engagement munitions with greater precision, increased range and lethality, and reduced collateral damage. The Army is currently restructuring the SDD contract.

120mm XM395 Precision Guided Mortar Munition (PGMM). PGMM is a 120mm precision (laser-guided) mortar munition, designed to defeat high-payoff targets at extended ranges. PGMM is the maneuver commander's "hip pocket" precision indirect fire weapon capable of providing responsive, standoff defeat of high-value targets. PGMM is in component advanced development (CAD). The Army plans to begin production in FY07 and field in FY08.

Protection. Joint forces must possess the capabilities to conduct decisive operations despite their adversaries' use of a wide range of weapons (including WMD), the conduct of

information operations (IO), terrorist attacks, or the presence of asymmetric threats during any phase of these operations. The Joint Force must protect personnel and other military and nonmilitary assets needed for conducting successful operations regardless of location.

Soldier Modernization. The Army's primary Soldier modernization concept is Soldier as a System (SaaS). SaaS provides all Soldiers with superior capabilities to accomplish assigned tasks or conduct missions against any opponent. SaaS includes a full DOTMLPF approach to resolve issues and enable Soldiers to do their jobs more efficiently and effectively. The SaaS concept will be the impetus for the alignment of Soldier systems management processes to aid in the establishment of fully integrated DOTLMPF Soldier requirements in support of the Soldier system architecture. It will establish a management structure and process to ensure the full integration of the Soldier in Current and Future Force O&O concepts. The SaaS objectives include improving lethality, survivability, command and control, mobility, and sustainment of the individual Soldier.

The Army's primary equipment system for networking the individual Soldier is the Land Warrior (LW) system. LW is an integrated Soldier fighting system. It enhances the lethality, battle-command compatibility, survivability, mobility, and sustainability of dismounted combat Soldiers, enabling them to engage and defeat enemy targets while minimizing friendly casualties. LW facilitates command, control, and sharing of battlefield information and integrates each Soldier into the digitized battlefield. The system incorporates communications, sensors, and power to improve capabilities without increasing the Soldier load.

LW components include a modular weapon system with thermal weapon sight, multifunctional laser with digital compass, video camera, and close combat optic; integrated headgear with helmet-mounted display and image intensifier; enhancements to protective clothing and individual equipment; and integrated individual Soldier computer/radio/GPS. The systems approach optimizes and integrates these capabilities, to include interface with the Army Tactical Internet. These components come together into a system to support the mission of the dismounted combat Soldier. The Army is already spiraling elements of LW, such as the interceptor body armor, into the Current Force.

Land Warrior Block II focuses on a dismounted/mounted interface to fully synchronize combined arms operations. The Army will insert advanced technology components in areas such as enhanced navigation, system voice control, weight reduction, digital connectivity, and power to meet Future Force requirements.

The Land Warrior program has entered developmental testing (DT). The Army expects to complete operational testing (OT) by the end of FY03. The current system is in compliance with all key performance parameters (KPP) for the LW initial capability (IC) increment. Fielding of the LW-Stryker interoperable capability increment will follow. In addition to Stryker connectivity and integration, LW-Stryker upgrades include combat identification, weight reduction, and increased power duration. The Future Force Warrior S&T program will develop technologies that will transition to the Land Warrior advanced capability development.

Countermine (CM). The countermine program provides assured and rapid surveillance, reconnaissance, detection, and neutralization of mines. The Ground Standoff Mine Detection System (GSTAMIDS) delivers a near-term capability to execute the on-route CM mission. Other systems in the program include the Handheld Standoff Minefield Detection System (HSTAMIDS), RDT&E for mine detection and neutralization, and a robotic combat support system.

Air and Missile Defense (AMD) Systems. AMD provides protection of critical bases—Army and joint—across the spectrum of operations. AMD capabilities in Current and

Future Forces execute a wide variety of overlapping offensive, defensive, stability, and support operations conducted simultaneously across the tactical, operational, and strategic levels of warfare. AMD modernization is on track to provide a multitiered capability able to defeat a significant and advancing threat. The Army is investing current resources on those capabilities that are time critical and provide the greatest benefits to the current Joint Force. To ensure effective balance, AMD modernization and transformation remains closely synchronized with other JTAMD elements to provide effective support for the Joint Forces.

The Army is modernizing some of its existing systems to enhance the capabilities of the Current Force. Patriot is a corps and echelon above corps (EAC) AMD system that can simultaneously engage and destroy multiple targets at varying ranges and altitudes. It is the world's only battle-proven theater missile defense (TMD) system. The upgraded Patriot Advanced Capability-3 (PAC-3) provides remote launch capability, increases range, altitude, and firepower with the PAC-3 hit-to-kill missile, and engages multiple maneuvering and nonmaneuvering TBM, air-breathing threat (ABT) and cruise missile threats. The PAC-3 missile is in LRIP. The PAC-3 completed operational test and evaluation (OT&E) in 3QFY02 and received a successful full-rate production decision in FY03.

PAC-3 Ground Support Equipment (GSE) upgrades are in procurement. Upgrades include the addition of medium- and high-range resolution waveforms, a dual traveling wave tube, and a new exciter to the radar. Other upgrades enhance the battalion's communication equipment and the ability to remotely locate launchers up to 30 km from the radar. These changes improve search, detection, track, and discrimination by the radar, increase battlespace awareness, and improve command and control. Patriot PAC-3 system upgrades to counter evolving threats, improve joint interoperability, and increase surveillance and detection capabilities are part of the evolutionary development.

Patriot will remain a key element of AMD for another 25 years. The Army addresses this requirement by funding the upgrade and modernization of Patriot PAC-2 Configuration two units to Patriot PAC-3 Configuration three units and funding Patriot recapitalization efforts. Because replacement systems will not emerge for at least 10 years, the Army will maintain the operational capability of the system through the Patriot Recapitalization Program. This program brings existing Patriot assets to a "like new" (zero miles, zero hours) state.

Currently, the Army only has the resources to upgrade eight of 10 AC Patriot battalions to PAC-3 Configuration three, allowing for a force of significantly different capabilities. Additionally, the PAC-3 missile inventory shortfall is a challenge. The Army's Acquisition Objective (AAO) is 2,200 PAC-3 missiles. However, there are funds for only 1,234 even though the Joint Theater Air and Missile Defense Organization (JTAMDO) missile inventory analysis pushes the PAC-3 missile requirement above 3,200.

Medium Extended Air Defense System (MEADS) is an international cooperative effort between the United States, Germany and Italy. OSD and the Army have designated it as a "clearly transformational" system. MEADS is a corps and EAC AMD system. It offers a significant improvement in tactical mobility and strategic deployability since it requires 50 percent less airlift than Patriot and is transportable intra-theater with C-130s and helicopters. MEADS provides continuous coverage alone or can couple with short-range air defense (SHORAD) systems in the corps and division area. It uses a netted and distributed architecture with modular, configurable battle elements. These attributes allow it to integrate with other airborne and ground-based sensors to provide a robust, 360-degree defense.

Beginning in FY04, the Patriot PAC-3 and MEADS programs merged to capitalize on the

resources available to both programs. This combined program provides for the spiral development and incremental fielding of MEADS major end items (MEI). This incremental fielding approach reduces sustainment costs while delivering increased AMD capability across the force earlier. This approach offers the most efficient use of valuable resources by eliminating dual development and sustainment efforts while giving maximum flexibility in regard to funding and changing warfighter needs. Current planning calls for the introduction of the objective launcher and Battle Management Command, Control (BMC4I) capabilities in FY09. The complete transformation of Patriot would begin with the introduction of the ground-based sensors in FY15.

Another of the Army's near-term AMD efforts centers on fielding of the GMD. GMD is a fixed, land-based system designed to provide limited protection to the United States against a ballistic missile attack. GMD system design focuses on ensuring high defense effectiveness against ballistic missile attacks of limited scope in a single operational configuration. The GMD architecture includes the following system elements: GMD Battle Management Command, Control and Communications (GBMC3), Upgraded Early Warning Radar (UEWR), In-Flight Interceptor Communications System (IFICS), Defense Support Program (DSP)/Space-based Infrared System (SBIRS), Ground-based Interceptors (GBI) and X-Band Radars (XBR). The Army has served as lead Service for GMD since 1999. On 16 December 2002, Presidential Directive 23 changed the program focus to the deployment of a continuous GMD operational capability by 1 October 2004 with a secondary and noninterfering mission as a test bed.

AMD units in the Future Force enhance full-spectrum joint operations with special-purpose capabilities and advanced strategic responsiveness to dominate, control, and exploit the joint aerial battlespace. Protection of the Joint Force encompasses the tactical, operational, and strategic levels of warfare. At all levels, AMD capabilities enable the Joint Force to see first, understand first, act first and finish decisively. The Army's long-term developmental AMD efforts focus on the fielding of the MEADS as a replacement to the Patriot missile system, the Theater High Altitude Area Defense (THAAD), the JLENS, and the Mobile Tactical High Energy Laser (MTHEL).

JLENS is a theater-based system using advanced sensor and networking technologies to provide wide-area surveillance and precision tracking of land attack cruise missiles. JLENS is a joint program with the Army as the lead organization. As a key element of the Single Integrated Air Picture (SIAP), JLENS integrates data from multiple sensors and C3I networks and provides correlated data to BMC4I nodes. JLENS consists of surveillance and fire control radars. JLENS provides OTH surveillance and precision track for broad area defense against land attack cruise missiles and low-flying threats. It also functions as a multipurpose aerial platform to enable extended range C2 linkages. JLENS is less expensive to buy and operate than fixed wing aircraft and can stay aloft for up to 30 days, providing 24-hour battlespace coverage over extended areas. The program is currently in the concept and technology development phase of its life cycle.

Sentinal Radar consists of a radar- based sensor system with its prime mover, IFF, and Forward Area Air Defense (FAAD) command, control, and intelligence (C2I) Interfaces. The Sentinel Modernization Enhanced Target Range and Classification (ETRAC) plan is a material enhancement of the Sentinel system.

The system provides current forward area SHORAD systems and the future Surface Launched Advanced Middle Range Air to Air Missile (SLAMRAAM) system with information dominance via a digital air picture for support of joint maneuver forces and critical assets. The data acquired and processed by the system gives the commander an integrated battle-

field picture and cueing and target identification information for SHORAD assets. The Sentinel Modernization program adds the capability to detect and classify small radar cross-section targets, such as cruise missiles and UAVs.

To engage at ranges beyond visual range, the SHORAD system must detect and track the target at sufficient range to alert and then cue the gunner to the target. The Sentinel modernization efforts extend the range of Sentinel. Gunners will receive cues with sufficient time to engage targets at ranges beyond visual range. Cueing alone, however, is not sufficient to support an engagement. Soldiers must identify the target as an engageable target based on the rules of engagement (ROE) and requirement of the defended assets. The modernization program allows Sentinel to determine aircraft type and supports manned versus unmanned determinations to facilitate precision engagements beyond visual range.

MTHEL is a combined U.S. and Israeli program to develop a mobile High Energy Laser (HEL) weapon system prototype capable of acquiring, tracking, engaging, negating and destroying short-range ballistic missiles (SRBM), rocket, artillery and mortar (RAM) threats, UAVs, cruise missiles, and air-to-surface munitions. In the near term, MTHEL uses deuterium fluoride (DF) chemical laser technologies to provide cost-effective kills while the solid-state laser technologies mature. The MTHEL system will integrate into existing air defense architectures. The current plan funds the development of system technical requirements, extended lethality testing, and risk reduction. The program will then enter a SDD-like phase to design, fabricate, integrate, and test two prototypes by FY07.

THAAD defends against short- and medium-range ballistic missiles at long ranges both inside and outside the atmosphere. THAAD protects largely dispersed U.S. and coalition forces and assets on a wide-area basis. THAAD's capability to intercept at both endo- and exo-atmospheric altitudes makes effective countermeasures against THAAD difficult. THAAD's integration with lower tier systems allows multiple intercept opportunities and significantly mitigates the effects of unitary and submunitions. The weapon system consists of five major components (missiles, launchers, radar(s), Battle Management/ Command and Control (BM/C2), and THAAD-specific support equipment). THAAD is in RDT&E development phase under the Missile Defense Agency (MDA). Flight testing begins in FY04. THAAD will transition from the MDA to the Army in FY06-07.

Focused Logistics. Focused logistics ensures delivery of mission-ready personnel, required equipment, agile sustainment and essential support in the right quantities, to the right place and at the right time.

Joint and Expeditionary Logistics. Joint and expeditionary operations necessitate joint and expeditionary sustainment. Multiple and simultaneous operations over extended distances in a distributed battlespace requires synchronization of all CSS assets from strategic national providers down to forward units at the tactical level. Sustainment must integrate a joint end-to-end distribution-based system with a single provider (authorized, responsible and resourced) at each level that can most effectively and efficiently provide support to the combatant and component commanders across the full spectrum of operations in a joint, interagency and multinational, and deployed, employ and sustain (DES) environment.

At the strategic level, there is no single joint manager for defense logistics or the logistics network. This fragmentation of sustainment causes duplication of effort, competing demands, and uncoordinated support. National providers and Service-centric logistics organizations must fully integrate and fuse under one joint logistics command (JLC) to synchronize and prioritize all national assets to enable effective joint logistics operations. This organization will not relieve the Services of their Title 10 responsibilities or

the regional combatant commanders of their directive authority for logistics.

Similarly, at the operational level there must be a single joint logistics regional command supporting the geographic combatant commander. This organization must draw from Service component organizations and staffs in addition to component specific support elements. The forming of a Joint Regional Support Command (JRSC) provides centralized distribution management with a single joint logistics commander bridging the strategic to the theater operational-level support for a combatant commander. Currently, no organization meets this need.

The JRSC will have subordinate joint-capable support commands (JSCs) from the Army that are modular, flexible, and expeditionary in nature. The JSCs by design rapidly deploy to an area of operations in support of a Joint Task Force (JTF). The JSC will provide critical effects-based logistics support bridging the gap of the operational to tactical level of support.

To best support combatant commanders, logistics must be a seamless, joint and expeditionary system. This paradigm shift requires a cultural change within all DOD components and agencies. This change includes the removal of Service and DOD agency seams, fusion of logistical capabilities, and establishment of clear lines of command and control throughout the DOD distribution network.

Logistics Programs. The goal of Army logistics support is the continuous, precise, and assured provisioning of deployed forces in any environment. Transformation in logistics ensures the ability of the JFC to generate, maintain, and employ dominant land power capability at every point in the campaign. The Army relies on the concept of DBL to achieve this goal. The key principles underlying DBL include: velocity over mass, multinodal and multimodal execution, centralized management with decentralized execution, maximum throughput, minimum essential stockpiling, seamless two-way flow of resources, in-transit visibility of stocks and supplies, unit- and mission-configured loads, real-time CSS situational understanding to enable anticipatory logistics, and time-definite delivery. The Army has several programs underway that support Logistics Transformation for the Current Force and developmental programs that support the Future Force.

The following programs support the Current Force: Battle Command Sustainment Support System (BCS3), Movement Tracking System (MTS), Medical Communications for Combat Casualty Care (MC4), Common Logistics Operating Environment (CLOE), and Satellite Communications for Support Activities. BCS3 provides the sustainment capability for the Army Battle Command System. It builds on the Logistics Common Operational Picture (LCOP) capability fielded during OIF as an interim solution. BCS3 provides the commander with the capability for combat power estimates, Blue Force Tracking, in-transit asset visibility, decision support tools and collaborative planning.

MTS is a critical Logistics Transformation enabler that allows in-transit visibility (ITV) of all theater common user transportation assets for the Joint Logistics Corporate Enterprise (JLCE) and enables DBL. MTS provides in-transit asset visibility and situational awareness that enables maneuver sustainment operations. MTS is a satellite-based tracking and communications system consisting of mobile unit transceivers, system control stations, GPSs, common operating software and MTS unique software. Fielding began with III Corps in 2001. Fielding will continue through 2022 at current funding levels.

MC4 is a family of COTS technology used to link healthcare providers, medical diagnostic systems and C2 systems at all echelons. MC4 provides decision-making healthcare information associated with medical C2, situational awareness, treatment, medical logistics, casualty movement, and healthcare delivery. Satellite Communications for Support Activities is an immediate and interim solution to assure con-

nectivity for logisticians. The priority is to field satellite terminals at every supply support activity and hospital. This capability affords logisticians the flexibility to see requirements in near real time, without relying on LOS communications.

The Common Logistics Operating Environment (CLOE) is the implementation of the Army's vision for developing a technology-enabled force equipped with self-diagnosing equipment platforms that interact with a networked sustainment infrastructure. The CLOE program works with all Army staffs, agencies and programs to synchronize sustainment doctrine and technology in implementing condition-based maintenance and anticipatory logistics. It also ensures sustainment system and platform interoperability across the Current and Future Forces. These operations include the synchronization of evolving doctrine and technology, integration of technology across commodities, and platform, communications and logistics to accomplish self-reporting, self-diagnosing platforms linked to a networked sustainment environment. Commonality is a key part of the CLOE operations in identifying, establishing, and providing recommendations on common standards, specifications, and protocols for use by program managers and enterprise integration data management.

The following programs provide Future Force transformational logistics capabilities: the Army Logistics Enterprise [comprised of Global Combat Service Support-Army (GCSS-A), Product Life Cycle Management Plus (PLM+), and the Logistics Modernization Program (LMP)]; TSV; and the Future Tactical Truck System (FTTS). The Force Application section of this chapter highlighted the capabilities of TSV. Its support to JLOTS and pre-positioning highlights TSV's contribution to Logistics Transformation.

The Army Logistics Enterprise (ALE) is the Army's primary enabler for CSS transformation and supports the functions of manning, arming, fixing, fueling, moving and sustaining of Soldiers and their systems. It is a primary Army logistical enabler supporting the Future Force sustainment strategy of the JLCE, DBL, PBL, and demand reduction. It is a commercial Enterprise Resource Planning (ERP) system implemented to integrate the Logistics Modernization Program (LMP), GCSS-A, PLM+, and all other components of the logistics portfolio. ALE will allow the Army to provide a seamless enterprise-wide logistics environment to the combatant commander, spanning factory to foxhole.

ALE provides the logistics input to the COP and features centralized management, a collaborative planning environment, a single authoritative data source, improved forecasting ability, total asset visibility, enhanced decision support capability, enterprise-wide maintenance data, and near real time logistics readiness information. Improved software achieves CSS integration currently lacking in the Army's present business systems and processes. For example, the GCSS-A will receive direct data feeds from the weapon systems and platforms based on the CLOE standards and FCS for management and delivery of CSS over the extended battlespace. This capability enables optimized combat power development.

PLM+ is a primary logistics enabler for Army Future Force network-centricity and establishes an Army single Master Data Management (MDM) virtual repository within the total enterprise architecture, which will support Army and Joint interdependence functions. The PLM contains the product life-cycle management business processes and technical data that will be configured based on Army logistics needs and is the tool for managing these end-to-end business processes. The PLM is a special access program (SAP)-preconfigured set of end-to-end business processes that flows across all levels of the logistics Army and also interacts with the weapon system Original Equipment Manufacturers (OEMs). The implementation of PLM+ is a critical component of the Army architecture

mandated by DOD that aligns the Army with the tenets of the Business Management Modernization Program (BMMP) and the Future Logistics Enterprise (FLE) as set forth by the Secretary of Defense (SECDEF) and the Deputy Undersecretary of Defense for Logistics.

The FTTS is the distribution platform for the Future Force. It incorporates technology improvements in the area of smart distribution, fuel efficiency, reliability, situational awareness, and force protection to provide the commander a maneuver sustainment platform capable of meeting the demands of the UA in the Future Force.

FACILITIES

Installations play a vital role for the transformed Joint Force. As the Army's flagships, they are essential in the development and sustainment of operational capabilities and readiness for the Joint Force. Deployment infrastructure at installations provides the strategic foundation for rapid force projection in support of JFCs. Installations extend from home station across the battlespace to seamlessly support the Joint Force. Installations enable mission accomplishment by providing information hubs, power projection platforms, combat preparation and sustainment bases, force protection, and family support.

Recognizing the requirement to enhance support to commanders, the Secretary of the Army directed the reorganization of the Army's management structure. On 1 October 2002, the Army placed the management of Army installations under the Installation Management Agency (IMA). IMA is a new field-operating agency of the Assistant Chief of Staff for Installation Management (ACSIM). Its mission is to provide equitable, efficient, and effective management of Army installations worldwide to support readiness; enable the well-being of Soldiers, civilians and family members; improve infrastructure; and preserve the environment. This new management approach eliminates the migration of base operations funds to other operational accounts below the HQDA level. It enables the development of multifunctional installations to support evolving force structure and Army Transformation needs.

The Army Installation Design Standards (IDS) provide mandatory common facility and infrastructure standards. Installations incorporate IDS to improve both the mission and visual aspects of every project on facilities. IDS is also a model to build tailored Installation Design Guides (IDG) for individual installations to meet specific needs while maintaining required standards.

With the strong support of Congress, the Army established the Residential Communities Initiative (RCI) for families. This program capitalizes on commercial expertise and private capital to perform a noncore function for the Army—family housing management. The program provides greater value to the Army by eliminating the housing deficit at our first 11 sites, while leveraging a $209M Army investment into $4.1B of initial private development. The Army's privatization program began with four pilot projects and expands to 18 active projects by the end of FY03. Pending OSD and congressional approval, 28 projects planned through 2006 will impact over 72,000 housing units or 80 percent of Army family housing in the United States. By the end of 2007, the Army plans to have the programs and projects in place to meet the OSD goal of eliminating inadequate family housing. The Army will accomplish this goal through RCI and increased Army military construction (MILCON) investment in nonprivatized family housing. The RC enhances RCI through real property exchange authority that is only available to the RC. This legislative authority allows the exchange of RC-owned property with public or private entities and has a tremendous potential to improve future RC infrastructure at no governmental cost.

Defense Reform Initiative Directive 49 and subsequent OSD guidance directed the Services to privatize utility systems unless exempted for security or cost reasons. Privatization improves the utility service for Army installations as new

owners upgrade the systems to industry standards. The Army is aggressively pursuing this initiative and has made considerable progress. The Army has privatized 83 of 351 systems with another 100 under active negotiations.

As part of Army Knowledge Management (AKM), the Army is modernizing the installation information infrastructure, or infostructure, to support a network-centric, knowledge-based Army. The Installation Information Infrastructure Modernization Program (I3MP) executes a multiyear, $3.2B program for upgrades to fiber optic and copper cable, installation of advanced digital equipment, and upgrades to Defense GIG gateways. This program ensures worldwide, high-speed data connectivity at Army installations. To date, the Army has completed 22 of 95 CONUS installations and initiated upgrades at 110 OCONUS installations. The Army plans to complete I3MP in 2009.

AKM is important to enable HSOCs, which serve as scalable, 24-hour operation hubs, to support deployed units by linking them to the national sustainment base, national assets, and other sources of knowledge. AKM also facilitates the LVC training environment crucial to a relevant and ready force.

This chapter describes the Army's concrete steps across DOTMLPF activities to build transformational capabilities. While not totally inclusive, these programs, systems, and initiatives demonstrate the holistic nature of Army Transformation in support of Defense Transformation. They also show the interdependence of Army capabilities with Joint Force capabilities. The next chapter details funding for some of these capabilities along with challenges the Army faces in balancing resourcing risks.